UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHANDRA V. MOULI

Appeal No. 2005-0830
Application No. 09/379,092

ON BRIEF

Before WARREN, WALTZ, and JEFFREY T. SMITH, **Administrative Patent Judges**.

WALTZ, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on an appeal from the primary examiner's final rejection of claims 1 through 3, 5 through 7, 33, and 35 through 39, which are the only claims pending in this application. We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellant, the invention is directed to a method of forming a trench isolation by implanting impurities in a region which enhance the oxidation of the semiconductor structure beyond that which would be expected from

crystallographic damage effects, and thereafter forming a trench through said region, leaving a portion of said region around the trench (Brief, pages 2-6).[1] Appellant states that claims 2-3 and 5-7 may be grouped with claim 1 while claims 35-39 may be grouped with claim 33 (Brief, page 6). However, appellant only presents specific, substantive arguments with respect to the separate patentability of claim 1 on appeal (Brief, pages 6-7). With regard to claim 33, appellant merely states that "for the reasons described above" the rejection of claim 33 should be reversed (Brief, page 8). Accordingly, pursuant to the provisions of 37 CFR § 1.192(c)(7)(8)(2003), we limit our consideration in this appeal to claim 1. *See In re McDaniel,* 293 F.3d 1379, 1383, 63 USPQ2d 1462, 1465 (Fed. Cir. 2002). Representative independent claim 1 is reproduced below:

> 1. A method of forming a trench isolation comprising:
>
> forming a region containing oxidation enhancing impurities in a semiconductor structure by implanting impurities which enhance the oxidation of said structure beyond that which would be expected from crystallographic damage effects; and
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> making a trench through said region, leaving a portion of said region around said trench.

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[1]We refer to and cite from the amended Brief dated Mar. 15, 2004.

The examiner relies upon the following references as evidence of unpatentability:

Hong	6,030,882	Feb. 29, 2000 (filed Dec. 30, 1998)
Batra et al. (Batra)	6,127,242	Oct. 03, 2000 (filed Oct. 24, 1994)

Claims 1-3, 7, 33, 35 and 39 stand rejected under 35 U.S.C. § 102(e) as anticipated by Hong (Answer, page 4).[2] Claims 5-6 and 36-38 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Hong (Answer, page 5, citing Batra as evidence supporting an Official Notice). We *affirm* both rejections on appeal essentially for the reasons stated in the Answer and those reasons set forth below.

OPINION

A. The Rejection under 35 U.S.C. § 102(e)

The examiner finds that Hong discloses the steps of forming a region containing oxidation enhancing impurities, using ion implantation at energies below 20 keV, in a semiconductor structure, and forming a trench through said region, leaving a portion of said region around said trench (Answer, page 4). The examiner states that it is inherent that the doping of a region

[2]We refer to and cite from the Supplemental Examiner's Answer dated May 18, 2004.

of a semiconductor structure enhances the oxidation rate of the structure, and the burden has been shifted to appellant to show that the oxidation enhancement of Hong is not caused by the impurities in the doped region (Answer, pages 5-6, citing *In re Best*, 195 USPQ 430 (CCPA 1977)).

Appellant argues that the examiner agrees that "Hong is silent on what produces the oxidation enhancement by implanting dopant species into the substrate" (Brief, page 7). Therefore appellant believes the Section 102 rejection should be reversed since the reference is silent as to whether the enhancement is due to crystallographic damage effects or some other effect (*id.*). Appellant further notes that the examiner never before relied on inherency and there is no objective or cogent technical reasoning to support such a conclusion (Reply Brief, page 2).[3]

Appellant's arguments are not persuasive. Hong discloses a process for forming shallow trench isolation structures where a region containing oxidation impurities is formed by implanting these impurities, and thereafter making a trench through said region, leaving a portion of said region around said trench (see Figures 2B and 2C; col. 2, ll. 50-59; and col. 3, l. 54-col. 4,

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[3]We refer to and cite from the Supplemental Reply Brief dated June 7, 2004.

l. 12). Hong teaches an angled ion implant technique for doping the impurities at an angle between 7° and 30° with an energy level between 10 and 50 keV at a dosage between 10^{13} and 10^{16} atoms per square centimeter (col. 2, l. 65-col. 3, l. 3). Appellant teaches that "it may be desirable" to use an angled implant to produce the impurity-doped region, with implant angles as high as 30° (specification, page 7, ll. 14-23). Appellant further teaches that it is desirable to use a relatively low energy implantation "[t]o minimize the amount of crystallographic damage that results from the implant," with implantation energies of less than 20 keV (specification, page 8, ll. 1-4). Appellant also teaches that, because of the low implant energies that may be used, high doses of 1 x 10^{15} atoms per square centimeter may be used (specification, page 9, ll. 9-12).

The examiner and appellant agree that Hong describes all the limitations of claim 1 on appeal except that the reference is silent as to whether the oxidation enhancement is due to crystallographic damage effects or some other cause (e.g., see the Reply Brief, pages 1-2). However, as previously discussed,

Hong describes process parameters that are the same or inclusive of every parameter disclosed by appellant. As stated by a predecessor of our reviewing court:[4]

> [I]t is elementary that the mere recitation of a newly discovered function or property, inherently possessed by things in the prior art, does not cause a claim drawn to those things to distinguish over the prior art. Additionally, where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied upon.

As further stated by the court in *Best*, 562 F.2d at 1255, 195 USPQ at 433-34:

> Whether the rejection is based on "inherency" under 35 USC § 102, on "prima facie obviousness" under 35 USC § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products. [Citation and footnote omitted].

Where, as here, the method of the prior art describes every parameter of the method as claimed and disclosed, we determine that there is reasonable belief that the ion implantation of Hong would have enhanced the oxidation of the doped region beyond that which would have been expected from crystallographic damage

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[4] *In re Best*, 562 F.2d 1252, 1254-55, 195 USPQ 430, 433 (CCPA 1977), quoting *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 229 (CCPA 1971).

effects. *See Best, supra; see also In re Woodruff,* 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990)("It is a general rule that merely discovering and claiming a new benefit of an *old* process cannot render the process again patentable"); *In re Spada,* 911 F.2d 705, 708, 15 USPQ2d 1655, 1657-58 (Fed. Cir. 1990)("we think that it was reasonable for the PTO to infer that the polymerization by both Smith and Spada of identical monomers, employing the same or similar polymerization techniques, would produce polymers having the identical composition"); *and In re Skoner,* 517 F.2d 947, 950, 186 USPQ 80, 82 (CCPA 1975)(description of the invention in terms of certain physical characteristics does not render patentable a method that is clearly shown in the prior art). We note that appellant has not proffered any evidence that the process of Hong will produce oxidation enhancement only due to crystallographic damage effects.

For the foregoing reasons and those stated in the Answer, we determine that the examiner has established a *prima facie* case of anticipation which has not been adequately rebutted by appellant's arguments. Accordingly, we affirm the examiner's rejection of claim 1, and claims 2-3, 7, 33, 35 and 39 which stand or fall with claim 1, under 35 U.S.C. § 102(e) over Hong.

B. The Rejection under 35 U.S.C. § 103(a)

The examiner has rejected claims 5-6 and 36-38 under Section 103(a) over Hong, citing Batra as evidence to support the taking of Official Notice (Answer, page 5). Appellant has not responded to this rejection (see the original Brief dated Sep. 28, 2001; the original Reply Brief dated Mar. 4, 2002; the Remand to the Examiner dated Aug. 26, 2003; the amended Brief dated Mar. 15, 2004; and the Supplemental Reply Brief dated June 7, 2004). Accordingly, we adopt the examiner's findings of fact and conclusion of law as stated in the Answer and summarily affirm this rejection.

C. Summary

The rejection of claims 1-3, 7, 33, 35 and 39 under 35 U.S.C. § 102(e) is affirmed. The rejection of claims 5-6 and 36-38 under 35 U.S.C. § 103(a) over Hong is also affirmed.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv)(effective Sep. 13, 2004; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat. Office 21 (Sep. 7, 2004)).

AFFIRMED

CHARLES F. WARREN)
Administrative Patent Judge)
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THOMAS A. WALTZ) BOARD OF PATENT
Administrative Patent Judge) APPEALS AND
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JEFFREY T. SMITH)
Administrative Patent Judge)

TAW:hh

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TROP PRUNER HU & MILES
8554 KATY FREEWAY
STE. 100
HOUSTON, TX 77024